Stoller
Hanford Office

GJO-2004-604-TAC

C4256
Log Data Report

Borehole Information:

Borehole: C4256			**Site:** Not Available		
Coordinates (WA St Plane)		**GWL[1] (ft) :** 302.4		**GWL Date:**	02/23/04
North	**East**	**Drill Date**	**Ground Level Elevation**	**Total Depth (ft)**	**Type**
Not available	Not available	02/20/04	Not available	418	Becker

Casing Information:

Casing Type	Stickup (ft)	Outer Diameter (in.)	Inside Diameter (in.)	Thickness (in.)	Top (ft)	Bottom (ft)
Steel	2.75	6.24	6.0	0.12	2.75	418
Steel	2.5	9.0	8.0	0.50	2.5	418

Borehole Notes:

The casing dimensions are derived from published values for Becker drill casing. Casing thicknesses at the joints are 0.875 and 0.240 in. for the 8- and 6-in. casings, respectively, for a total thickness of 1.115 in. at the joint. The total depth of the borehole was provided by the Fluor well site geologist. Stoller provided the depth to water from TOC. Logging data acquisition is referenced to the ground surface.

Logging Equipment Information:

Logging System:	Gamma 1E		**Type:**	SGLS (70%) SN: 34TP40587A
Calibration Date:	01/04	**Calibration Reference:**	GJO-2004-568-TAC	
		Logging Procedure:	MAC-HGLP 1.6.5, Rev. 0	

Spectral Gamma Logging System (SGLS) Log Run Information:

Log Run	**1**	**2**	**3 Repeat**	**4**	
Date	02/23/04	02/23/04	02/24/04	02/24/04	
Logging Engineer	Spatz	Spatz	Spatz	Spatz	
Start Depth (ft)	418.0	188.0	61.0	18.5	
Finish Depth (ft)	187.0	19.0	19.0	1.0	
Count Time (sec)	N/A[2]	N/A	N/A	N/A	
Live/Real	R	R	R	R	
Shield (Y/N)	N	N	N	N	
Sample interval (ft)	0.5	0.5	0.5	0.5	
MSA Interval (ft)	N/A	N/A	N/A	N/A	
ft/min	1.0	1.0	1.0	1.0	
Pre-Verification	AE090CAB	AE090CAB	AE091CAB	AE091CAB	
Start File	AE090000	AE090463	AE091000	AE091085	
Finish File	AE090462	AE090801	AE091084	AE091120	

Log Run	1	2	3 Repeat	4	
Post-Verification	AE090CAA	AE090CAA	AE091CAA	AE091CAA	
Depth Return Error (in.)	N/A	-3	N/A	-1	
Comments	Fine-gain adjustment before logging started at bottom of the borehole.	No fine-gain adjustment.	No fine-gain adjustment.	No fine-gain adjustment.	

Logging Operation Notes:

Total gamma data were collected in a continuous logging mode (referred to as the gross gamma logging system [GGLS]) from 1 to 418 ft. This logging mode was selected to expedite logging as the total logging time for the borehole is reduced from approximately 17 to 6 hours. During continuous logging mode, data are acquired over 0.5-ft intervals for 30 seconds or 1 ft per minute. The data files are written at the midpoint of the logging interval. For example, an interval logged from 0 to 1 ft will result in data files at 0.25 and 0.75 ft. The file at 0.25 ft represents an average of the data acquired from 0 to 0.5 ft. The counting time with the GGLS is not sufficient to acquire statistically meaningful spectral data for the naturally occurring radionuclides. Logging was conducted with a centralizer on the sonde and measurements are referenced to ground surface. A repeat section was collected in this borehole to evaluate system performance.

Analysis Notes:

Analyst:	Henwood	Date:	03/08/04	Reference:	GJO-HGLP 1.6.3, Rev. 0

Pre-run and post-run verifications for the logging system were performed before and after data acquisition. Acceptance criteria were met.

Casing thickness (additive for the 6- and 9-in. casings) is approximately 0.625 in. The combined thickness at casing joints is 1.115 in. This thickness results in a significant reduction in gamma activity detection as the detector passes by a casing joint. However, it is not practical to correct individual data points for the effect of casing joints. The influence of the thick joints is apparent on the total gamma where reduced count rates are exhibited at approximately 10-ft depth intervals.

SGLS spectra were processed in batch mode using APTEC SUPERVISOR to extract the total gamma count rate from individual files. For the GGLS, no corrections are made for dead time, casing, or water.

Log Plot Notes:

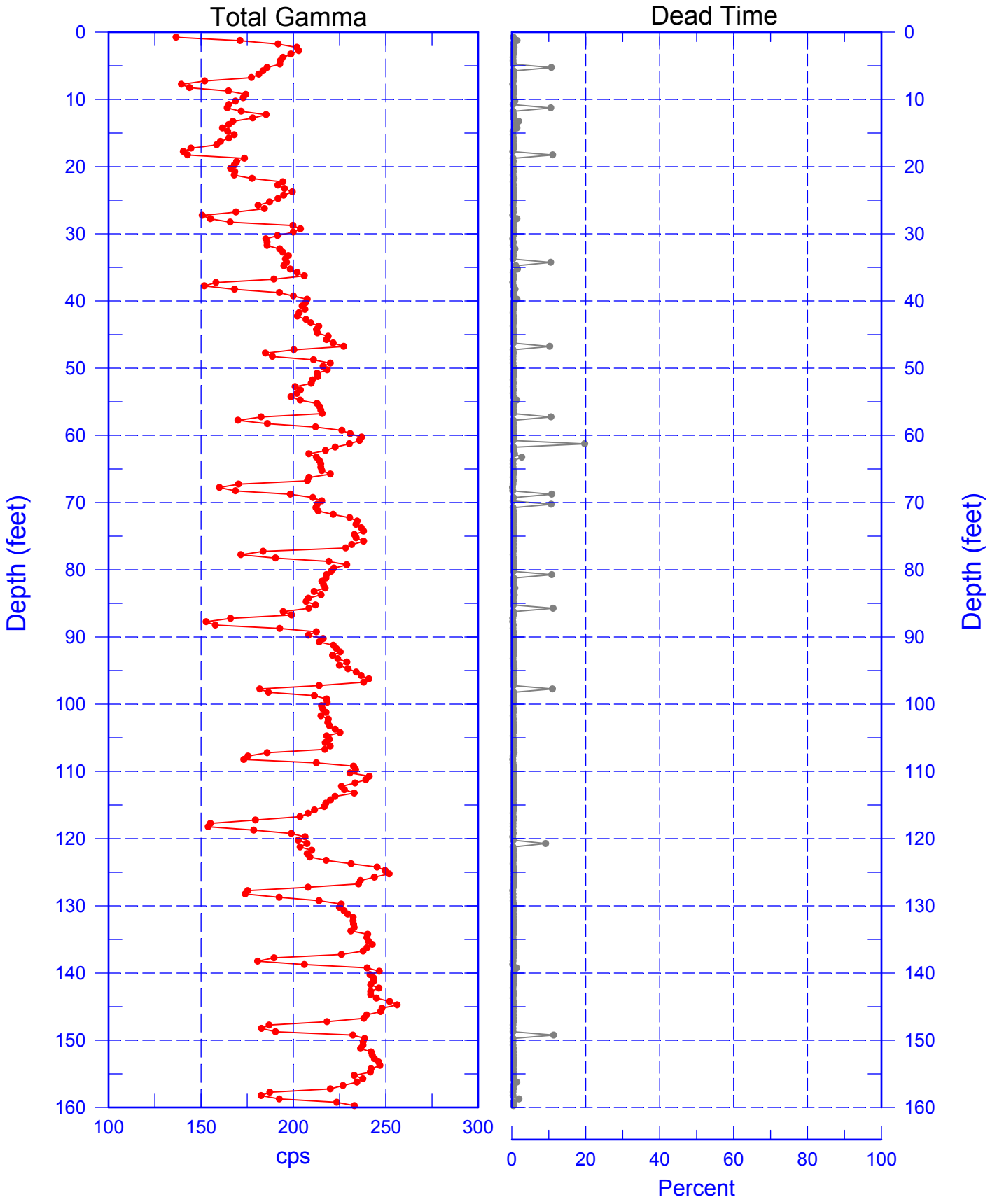
For the GGLS, log plots are provided for the total gamma and dead time. A repeat log section is presented for the depth interval between 19 and 61 ft.

Results and Interpretations:

The Becker drilling method is not conducive to obtaining high quality geophysical spectral log data. However, the deployment of the GGLS appears to be a reasonable compromise to achieve a logging speed that can support an ongoing drilling project efficiently while retaining the ability to scan for the existence of significant man-made radionuclide contamination and provide a continuous record of gamma activity. The repeat section indicated good agreement of the total count rate acquired by the GGLS.

[1] GWL – groundwater level
[2] N/A – not applicable

C4256
Total Gamma & Dead Time

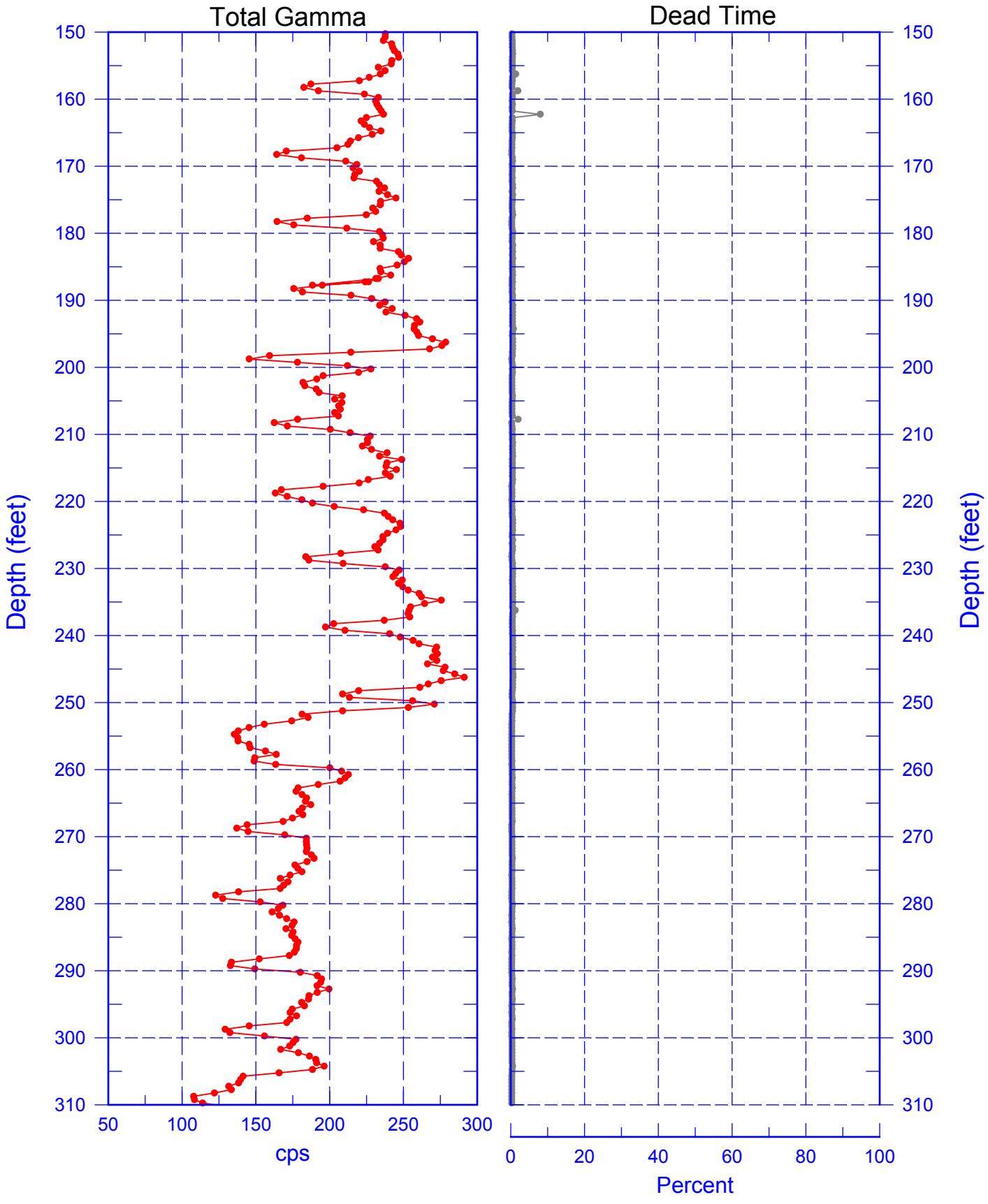


Reference - Ground Surface

Depth scale: 1" = 20 ft

Last Log Date - 02/24/04

C4256
Total Gamma & Dead Time

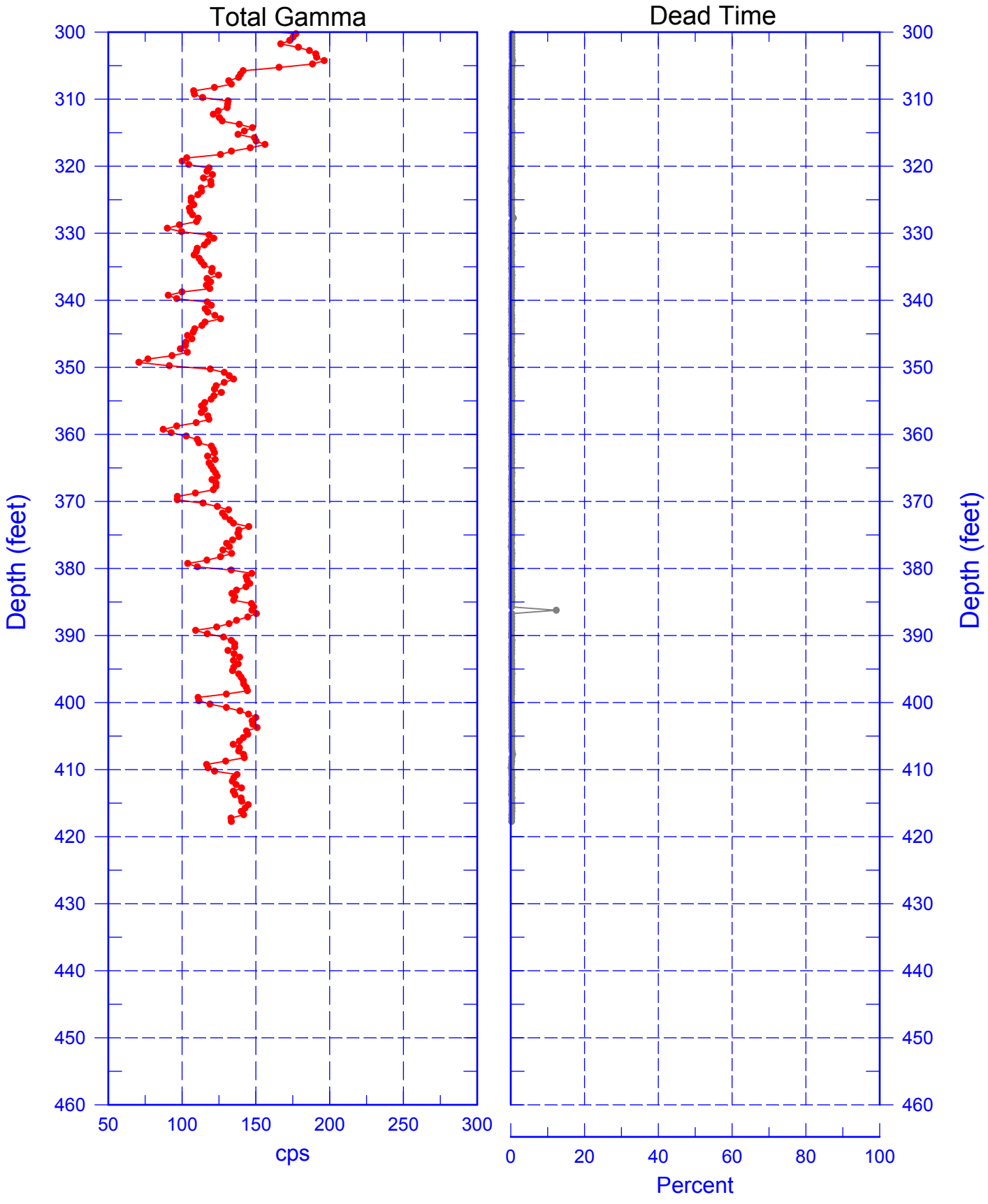


Reference - Ground Surface

Depth Scale: 1" = 20 ft

Last Log Date - 02/24/04

C4256
Total Gamma & Dead Time



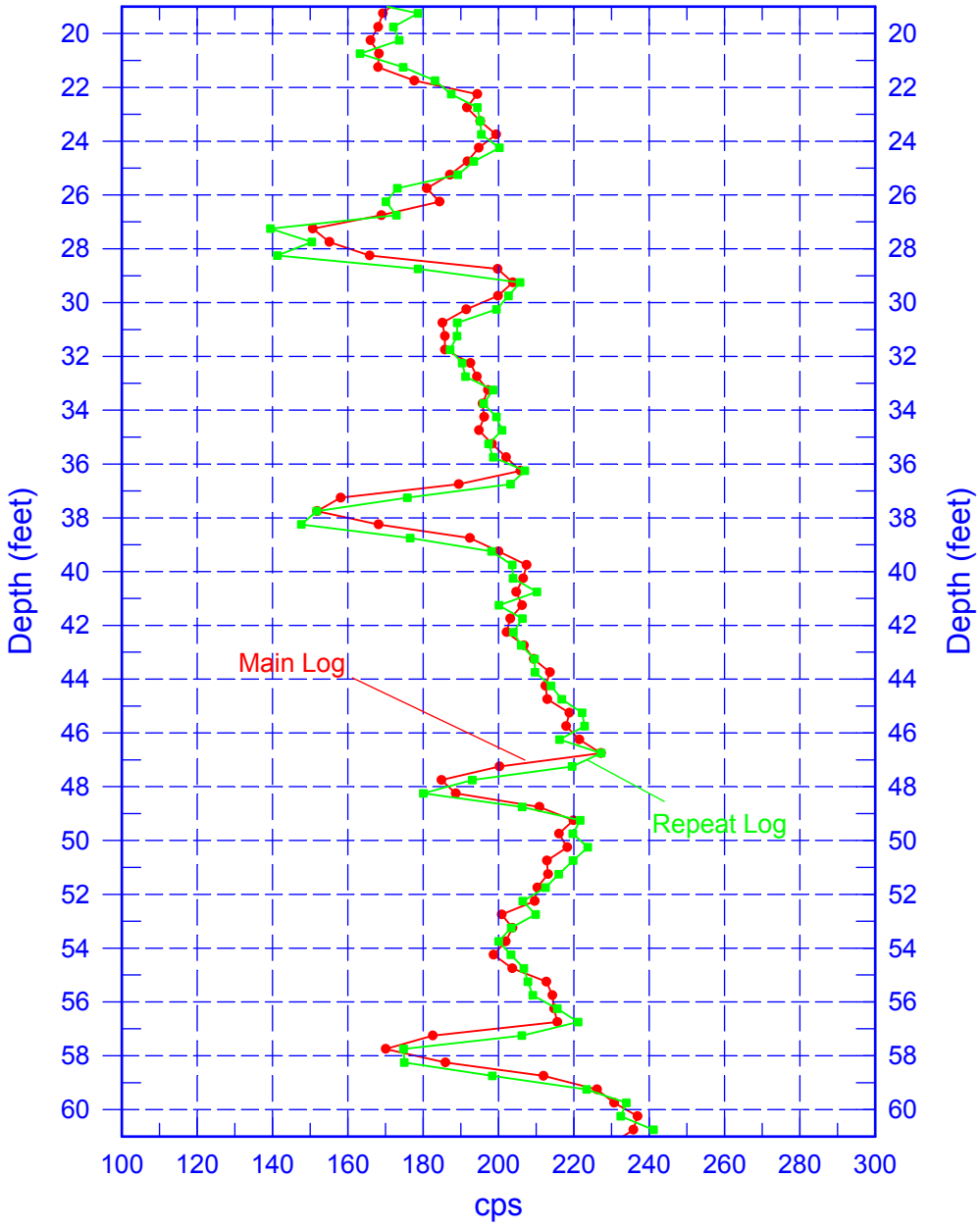
Reference - Ground Surface

Depth Scale: 1" = 20 ft

Last Log Date - 02/24/04

C4256

Total Gamma Repeat Section



Reference - Ground Surface

Last Log Date - 02/24/04